

# The National Attack on Rheumatic Fever

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WHILE we have made a great deal of progress against rheumatic fever, it is still a killer and crippler; it is still a national menace. Cold statistics give us an idea of its extent, but they can never measure the full tragedy, the hurt to the families whose children have been struck down with this disease. It has been estimated that about 2 million people living in the United States today have already had, or will develop, an attack of rheumatic fever at some time during their lives. Of these, more than 500,000 will probably die because of the rheumatic process or some complication developing directly from it. Rheumatic fever most often strikes children between the ages of 5 and 15, and the resulting rheumatic heart disease causes about 50 percent of all heart disease in this age group. I am told that in the 5- to 19-year age group in this country there is a current annual incidence of about 60,000 cases of rheumatic fever. About half of these are recurrences, and half first attacks.

The total economic waste caused by rheumatic fever in the general population cannot be even roughly estimated. But we do know that during World War II, rheumatic fever alone immobilized more than 400,000 men in the armed services, at a cost to the Government of about \$640 million.

We must never lose sight of our ultimate goal: the complete eradication of this killer and crippler. Let us hope that the progress we have made will whip us into even further—and unrelenting—efforts. I think it will.

The concerted national attack on rheumatic fever, in which the Federal Government plays an important role, has shown spectacular growth since it began less than a decade ago. Rheumatic fever and rheumatic heart disease are, of course, a major concern of the National

Heart Institute, Public Health Service, and research support in this area has increased more than tenfold since 1949 to a current total of around \$1.5 million annually. The institute conducts a substantial research program of its own in Bethesda, but devotes most of its funds to the support of cardiovascular research in hospitals, universities, medical schools, and other institutions throughout the country.

The institute's research grant program in rheumatic fever and rheumatic heart disease is helping scientists approach the problem from many different directions. Population studies are bringing in new knowledge of the movement of streptococcal infection among families and individuals. Scientists are also trying to find out more about the nature of immunity from these infections.

One of the most urgent needs in this field is for more fundamental knowledge of the intricate cellular events and mechanisms of connective tissue, the target of rheumatic fever. For this we need more intricate equipment and more highly skilled workers.

Since the most widely accepted theory of the nature of rheumatic fever is that it is an allergic reaction of certain of the connective tissues to some substance given off by the streptococcus—the cause of streptococcal infections—attention is being focused on the biochemical and biophysical mechanisms involved in allergic responses, and attempts are being made to identify the streptococcal substance to

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which approximately 3 percent of all children between the ages of 5 and 12 seem to be allergic.

### **Gains in Research**

As has often been the case, victory over a disease may be greatly speeded if it can be produced experimentally and studied in animals. For many years, rheumatic fever research has been hampered by inability to produce it in the laboratory. But now scientists believe they have achieved this. Rabbits given repeated injections of streptococci have developed heart defects similar to those of rheumatic heart disease. If further research bears this out, the work should serve as a valuable springboard.

Drug studies are of paramount importance, because we do not as yet have an ideal drug or drug combination for treating rheumatic fever itself. We now know that ACTH and cortisone, at least in the smaller doses used in early studies, are no more effective in treating rheumatic fever than aspirin. We found this out from a very valuable international study conducted in 13 hospitals in the United States, Canada, and Great Britain with the aid of the National Heart Institute. Dr. Albert V. Dorfman and his group at the La Rabida Sanitarium are, I understand, analyzing statistically the first results of a large-scale study they have made of hydrocortisone therapy in rheumatic patients, in which substantially larger doses of drugs have been used.

We now have enough knowledge about the control of rheumatic fever to make possible an adequate and thorough program of preventing it in any community.

### **Services for Children**

Developments in the treatment of children with congenital heart malformations in the last two decades have been truly dramatic. The number of children who were previously doomed to an early and inevitable death has been drastically reduced by the development and use of a wide variety of surgical techniques.

Since 1939, the Children's Bureau through its crippled children's program has been offering children with rheumatic fever medical help

that may limit the impairing effect on their later productive lives. At present, all but one State offer services to children with rheumatic heart disease in the crippled children's programs which have developed as a part of the Federal-State partnership.

More recently, the Bureau, with the cooperation of the States, has developed ingenious patterns to make complicated heart surgery available to the maximum number of children with congenital heart defects who can benefit from such surgery. Not only through the regular crippled children's programs but through five regional heart centers as well, children are now receiving surgery for congenital heart malformations which for many of them can make the difference between life and death. The number who have been served under this part of the crippled children's program increased from 2,000 in 1950 to 10,000 in 1957. In the meantime, a variety of surgical techniques, most recently open-heart surgery, have been developed. As a result the number of congenital heart conditions which are operable has increased. At the request of the administration, Congress recognized this development during the current session by appropriating \$1.5 million above regular funds for the crippled children's programs to be used especially for these lifesaving heart malformation operations.

### **Prevention and Control**

Illustrative of another approach to the prevention of rheumatic fever is the drive conducted jointly several years ago by the National Heart Institute and the American Heart Association. It made an important contribution. Various aids for physicians and other health workers, such as folders giving the latest diagnostic criteria and treatment recommendations, were sent to every physician in the United States.

Another branch of the Public Health Service, the Bureau of State Services, has played an important part in the national attack on rheumatic fever through its Heart Disease Control Branch. This branch assists States and localities, both through financial grants and assignment of people with special technical skills when they are needed, in establishing and im-

proving heart disease control activities. The establishment of rheumatic fever registers and prophylaxis programs and the development of better rheumatic heart disease diagnosis and casefinding methods are of course vitally important.

In Chicago a new study was started in April 1959 to test the practicality of mass screening as a way of finding children who should seek medical attention for possible heart defects, including those caused by rheumatic fever. A special tape-recording device, developed by the Chicago Heart Association, is being used. The study, in which the heartbeats of 40,000 fourth-grade school children will be recorded, will aid health workers in finding out what problems may be involved in large-scale screening programs of this kind and will also provide data on the number of children with undetected heart defects.

Guiding the project with the Public Health Service is an interagency committee composed of representatives from the Chicago Board of Health and Board of Education, the Chicago Medical Society, the American Heart Association, the Children's Memorial Hospital, the parent-teachers association, and several universities. Since the outlook for children with heart abnormalities is much better if their condition is diagnosed and treated early, the adoption of faster and less expensive methods of finding early cases would certainly save many lives.

Recently, exploration of another promising and rather novel possibility—the use of an electronic computer as an aid to the physician diagnosing cardiovascular disease—was begun by the Heart Disease Control Branch. The basic idea is to develop a computer into which all pertinent objective data could be fed, such as data concerning the electrocardiogram, the phonocardiogram, the ballistocardiogram, and the arterial pulse, together with such factors as age, sex, height, weight, and blood pressure. The computer would then indicate to the physician the probability of specific heart diseases or injuries.

These, of course, are only illustrations of the work affecting the rheumatic fever problem that the Heart Disease Control Branch is aiding. The encouragement and help that it has given State and local health departments to establish and enlarge rheumatic fever programs has been one of the major factors in the tremendous growth of this nationwide endeavor.

The number of States assuming a responsibility for either or both prevention and treatment of rheumatic heart disease increased from 12 in 1950 to 40 in 1958. Also, the number of States now engaged in the distribution of free or low-cost prophylactic drugs has increased from 2 in 1950 to 29 in 1958. A number of the remaining States that have not yet developed programs are encouraging rheumatic fever and rheumatic heart disease control efforts both in local health departments and in nonofficial agencies. These facts certainly show a great public awakening to the problem in this decade.

Along with this awakening to the problem in this and other areas of health research has come some concern that today's large Federal grants in the field of medical research are stifling private giving in the field of health. The fact is that nothing could be farther from the truth.

Support for medical research from all sources jumped from \$88 million in 1947 to about \$450 million this year. Of this \$450 million, the Federal Government contributed approximately half, and the balance came from industry, endowment, and private philanthropy.

In June 1958 a group of consultants on medical research and education, headed by Dr. Stanhope Bayne-Jones, made their report after an exhaustive nationwide study. I was particularly interested in this comment in the report: "Americans have always banded together voluntarily to accomplish certain commonly valued objectives. This has been particularly evident in the health field. . . . Humanitarian sentiments and religious doctrines that foster respect for life and for the individual, combined with respect for science, will engender continuing and strong support for medical research from both public and private sources."